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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/774,778

02/09/2004

Gregor Dudziak

Bayer 10269-WCG

8841

27386 7590 04/10/2008
NORRIS, MCLAUGHLIN & MARCUS, P.A.
875 THIRD AVE
18TH FLOOR
NEW YORK, NY 10022

EXAMINER

MENON, KRISHNAN S

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

04/10/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Claims 1-8 and 10-17 are pending as amended 10/9/07 in the RCE.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-8,10,11 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Karau, et al (US 6,472,571).

Karau teaches a process for separation from a non-aqueous homogeneous or colloidal solution of a catalyst (abstract, column 2, lines 38-44), with a ceramic membrane having a hydrophobic coating of alkoxysilanes as claimed (see the silanes in column 3, lines 45-67).

Membrane porosity is less than 10 nm preferred (column 4, lines 1-10).

Ceramic is alumina, etc (column 4, lines 9-17)

Non-aqueous solvents taught; specific examples are THF and methanol. (table 1 and 2, examples)

Temperature is in the range claimed – column 2, 3-10; more over, the range includes ambient, and unless the reference specifies a temperature, ambient temperature would be implied. Pressure required for the membrane process also would be implied in the reference, unless applicant can show criticality of the range.

Applicant's arguments traversing this rejection are not persuasive.

Interpretation of claim 1: Claim 1 recites in part relevant to applicant's arguments traversing this rejection:

Claim 1 (**currently amended**) Process for the separation from a non-aqueous solvent of a **solid** substance which is present in said non-aqueous solvent in dissolved form, colloidal form, or in both of such forms, **without changing the molecular weight of said solid substance**, which comprises passing said non-aqueous solvent through a membrane having:

The emphasized part of the claim requires that the substance in dissolved or colloidal form is solid; and its molecular weight should not change during the claimed process, that is, its molecular weight should not change while being separated from the non-aqueous solvent using the membrane.

The reference teaches use of a ceramic membrane, as claimed, in recovering dissolved or colloidally soluble catalyst (column 2, lines 29–64). The reference does not teach synthesizing the catalyst, but only teaches using the catalyst for synthesizing organic compounds. The term 'increased molecular weight' in this reference appears to mean only having a *higher molecular weight*. The office does not believe that the catalyst is somehow growing in molecular weight in the process described in this reference. This is evident from the paragraph at column 4, lines 32-41. This paragraph teaches about catalyst "Catalyst having increase molecular weight made from dendritic, linear or variously branched homopolymer ...", etc., which only explains the source for the catalyst. Column 5, lines 17-25 teaches the definition of the "increased molecular weight". Example 2 in the reference teaches the process as claimed, wherein a catalyst of molecular weight 38kD dissolved in THF is used to reduce tetralone to tetralol, which

is circulated through a ceramic membrane. The claims of the reference also anticipate the instant claims.

Moreover, even if the reference had taught the catalyst molecules as 'growing' in molecular weight, it still would anticipate the instant claims – the membrane is the same as what applicant claims, and the process would then be inherent.

Argument that the reference teaches only two layers is not persuasive: the reference has a ceramic support layer, an inter layer and a silane layer.

Argument that the Karau reference teaches catalyst of increased molecular weight (or larger molecular weight) is not commensurate in scope with the claim or the rejection. The claims are not limited by the molecular size of the catalyst. However, adding such a limitation to the claims also would not make the claims patentable – it would be inherent in the teaching of the reference, because the membrane of the reference would separate any dissolved substance whose molecular weight above the cut-off molecular weight of the membrane.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 12-14 are rejected under 35 U.S.C. 102(b) as anticipated by Karau, or alternately, under 35 USC 103(a) as being unpatentable over Karau as applied to claim 2 in paragraph 2 above, and further in view of WO 01/07157.

Claims differ from the reference in the teaching of the catalyst. However, as stated in paragraph 3 above, under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). In the instant case, the membrane used is the same as claimed, therefore Karau reference could be considered as anticipating the claims.

WO teaches a process for separating solutes or colloids such as catalysts (page 7, 8: rhodium-organophosphite complex) from a non-aqueous solution. Membrane is ceramic (alumina, zirconia: page 10), with coating (the sub-nanoporous coating of metal or ceramic or inorganic polymeric material is a coating (page 7) (but WO does not teach the specific silane claimed). It would be obvious to one of ordinary skill in the art at the time of invention to ***use the teaching of WO in the teaching of Karau to use the Karau membrane for such applications as taught by WO.*** One would use the Karau membrane as modified by WO for such applications because of the advantages of Karau membrane, such as extremely high retention ability of the catalyst, as taught in column 2, lines 51-64.

In response to the argument traversing this rejection:

As argued above, employment of the membrane disclosed by Karau in the process of WO would yield loss of enablement of separating the catalyst from the liquid without having to increase the molecular weight of the catalyst. Therefore the combination of the teachings of Karau with WO can not overcome the discrepancies between Karau and Applicant's invention.

This argument is not persuasive. WO teaches pore size 15A or less for separating catalyst particles of size 30A or less – see page 9 of WO. The silane coating of Karau would provide the improvements as taught by Karau. Therefore, one would modify Karau with the teaching of WO for the particle size, or WO membrane with the teaching of the silane coating of Karau for having an improved membrane for separating the particle size as in WO with the efficiency of Karau.

3. Claims 1,2, 7,8 and 10-17 are rejected under 35 U.S.C. 102 (b) as being anticipated by, or in the alternative, under 103(a) as being unpatentable over Cohen (US 6,440,309).

Cohen teaches a process for separation from non-aqueous solutions of a substance by pervaporation – pervaporation is a process of separating liquid mixtures using a membrane (abstract, and column 1 lines 1-23). Membrane is porous with pore size less than 2-50 nm (20-500A), formed on a ceramic substrates (alumina, etc: column 6 lines 50-65), and hydrophobic coating applied by reaction with tetraethoxysilane (column 6 lines 1-25). Surface is hydrophobic – the silane used is as claimed – see the structure in column 6.

Applicant's process as recited in claim 1 is a method comprising passing a non-aqueous solvent through a ceramic membrane having a silane coating, and having a mean pore size not more than 30 nm. The solid substance in colloidal or dissolved form in the preamble of the claim 1 does not appear to be limiting. Cohen differs from the claims in the solute separated being a "solid" and a catalyst. However, since the membrane is capable of removing volatile solvents from a solution, the reference anticipates, or at least makes obvious, the claimed process. Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986).

However, even if the preamble of the claim is considered limiting, the claims are still anticipated, or made obvious by the reference by in re King. Process of removing volatile organic solvents using membranes is known in the art; one of ordinary skill would use the teaching of this reference to remove organic solvents from the solution as taught by this reference using the membrane of the reference. See KSR Int'l. v. Teleflex Inc., 127 S. Ct. 1727, 1732, 82 USPQ2d 1385, 1390 (2007). "it is commonsense that familiar items have obvious uses beyond their primary purposes". "Substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention". In this case, the process is removing organic

solvent from a solid material that is dissolved in or in colloidal suspension in the solvent. Since the process described the reference removes organic solvents from a similar situation, i.e., having dissolved or emulsified water, removal of organic solvents from the catalyst solution is predictable.

Applicant's argument about pervaporation process is not commensurate in scope with the claims or the rejection. The membrane taught by the reference is the same as what applicant uses. Therefore the argument,

As pointed out above, the Cohen reference is directed towards a separation of liquid components from each other, and the membrane employed by Cohen for doing the same would never perform as membrane in Applicant's claimed invention.

is not persuasive. Pervaporation is a process of separating a volatile solvent from the solution in vapor phase. Therefore, the volatile solvent from the solution permeates through the membrane, concentrating the solution of the dissolved solid substance. Thus the solutes remain in the solution. Applicant's claimed invention does not discriminate transfer across the membrane in vapor phase. The claim is for the separation of a non aqueous solvent from a solution having a dissolved or colloidal solid substance using a membrane of specific description. The reference teaches the separation of a solvent from a solution using a membrane of the same specific description. Therefore, the reference anticipates the claim, or at least makes it obvious, as shown.

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4. Claims 1-8 and 10-17 are rejected under 35 U.S.C. 35 USC 103(a) as being unpatentable over Cohen as applied in paragraph 3 above and further in view of WO 01/07157.

Instant claims differ from the teaching of Cohen in having the solute as a catalyst. However, under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). In the instant case, the membrane used is the same as claimed, therefore Cohen reference could be considered as anticipating the claims.

WO teaches a process for separating solutes or colloids such as catalysts (page 7, 8: rhodium-organophosphite complex) from a non-aqueous solution. Membrane is ceramic (alumina, zirconia: page 10), with hydrophobic coating (the sub-nanoporous coating of metal or ceramic or inorganic polymeric material is a coating (page 7) (but WO does not teach the specific silane claimed). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of WO in the teaching of Cohen to use the Cohen membrane for such applications as taught by WO. One would use the Cohen membrane for such applications because of the advantages of Cohen membrane as taught in column 5 lines 44-63 and column 7 lines 47-52.

Response to Arguments

Applicant's arguments filed with the RCE of 2/25/08 have been fully considered but they are not persuasive. Responses are included in the rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Krishnan S Menon/
Primary Examiner, Art Unit 1797